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Fax No.: (703) 872-9355

Subject: Serial No. 09/671,201

FROM

Name:

David W. Hill

Fax # Verified by: Sylvia Helms

Our File No.: 07553.0009

Phone No.: (703) 308-3836

Date: March 6, 2002

Phone No.: (202) 408-4020

Pages (incl. this):

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7553,0009

DUNKKM

PLEASE STAMP TO ACKNOWLEDGE RECEIPT OF THE FOLLOWING:

In Re Application of: Michiaki SANO

Serial No.: 09/671,201

Filed: September 28, 2000

For: PLASMA PROCESSING METHOD

Group Art Unit: 1765

Examiner: Lan Vinh

1. Petition to Restart Period for Response to Office Action

Dated February 14, 2002

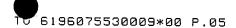
Docket No.: 07553.0009

David Hill/Kevin Mun/Sylvia Helms - Mail Drop 1030



(Due Date:)

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United States Patent and Trademark Office

C7 1.

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.		
09/671,201	09/28/2000	Michiaki Sano	07553.0009			
7:	590 01/09/2002					
	derson Farabow Garrett	EXAMINER				
1300 I Street N Washington, D	-		VINH, LAN			
			. ART UNIT	PAPER NUMBER		
			1765	7,		
			DATE MAILED: 01/09/2002			

Please find below and/or attached an Office communication concerning this application or proceeding.

RECEIVED

: 42 / 2002

FINNEGAN, HENDERSON, FARABOW, GARRETT AND DUNNER, LLP

Docketed 2.7-02 Attorney DWH
Case 7553 0009
Due Date 4.9-02 VCF
Action By

PTO-90C (Rev. 07-01)



	Application N .	Applicant(s)					
Coffice Action Summer.	09/671,201	SANO, MICHIAKI					
Office Action Summary	Examin r	Art Unit					
	LAN VINH	1765					
- Th MAILING DATE of this communi ation app Period for Reply	- The MAILING DATE of this communication appears in the cover sheet with the correspondence address Period for Reply						
A SHORTENED STATUTORY PERIOD FOR REPLY THE MAILING DATE OF THIS COMMUNICATION. - Extensions of time may be available under the provisions of 37 CFR 1.13 after SIX (6) MONTHS from the making date of this communication. - If the period for reply specified above is less than thirty (30) days, a reply - If NO period for reply is specified above, the maximum statutory period v - Pailure to reply within the set or extended period for reply will, by statute, - Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b). Status	35(a). In no event, however, may a reply be tim within the statutory minimum of thiny (30) day- rill apply and will expire SIX (6) MONTHS from cause the application to become ABANDONE	nely filed s will be considered timely. the malling dale of this communication. D (35 U.S.C. § 133).					
1) Responsive to communication(s) filed on 9/26	<u> 2000</u> .						
2a)☐ This action is FINAL. 2b)⊠ Th	is action is non-final,						
Since this application is in condition for allowated closed in accordance with the practice under							
Disposition of Claims							
4) Claim(s) 1-6 is/are pending in the application.							
4a) Of the above claim(s) is/are withdray	vn from consideration.						
5) Claim(s) is/are allowed.							
6)⊠ Claim(s) <u>1-6</u> is/are rejected.	•						
7) Claim(s) is/are objected to.							
8) Claim(s) are subject to restriction and/o	r election requirement.						
Application Papers							
9) The specification is objected to by the Examine	r.						
10) The drawing(s) filed on is/are: a) accept		miner.					
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).							
11) The proposed drawing correction filed on	is: a) ☐ approved b) ☐ disappro	oved by the Examiner					
If approved, corrected drawings are required in re	oly to this Office action.						
12)☐ The oath or declaration is objected to by the Ex	aminer.						
Priority under 35 U.S.C. §§ 119 and 120							
13) 🖾 Acknowledgment is made of a claim for foreign	priority under 35 U.S.C. § 119(a)-(d) or (f).					
a)⊠ All b)□ Some * c)□ None of:							
1. Certified copies of the priority document	s have been received.						
2. Certified copies of the priority document	s have been received in Applicati	on No. <u>09/671,201</u> .					
 Copies of the certified copies of the prior application from the International Bu See the attached detailed Office action for a list 	reau (PCT Rule 17.2(a)).	_					
	·						
14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application). a) The translation of the foreign language provisional application has been received.							
15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.							
Attachment(s)	_						
1) Notice of References Cited (PTO-892) 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2	5) Notice of Informal (y (PTO-413) Paper No(s) Patent Application (PTO-152)					

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

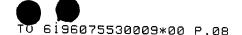
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1, 3, 5, 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Li et al (US 6,284,149)

Li discloses a plasma etching process for removing a photoresist film 166, the photoresist film 166 with an opening pattern 168 having an opening area 168 larger than opening area of a hole 22 formed at insulating layer 16 of a substrate/workpiece 10, the opening 168 is used as a mask to plasma etch through the insulating layer 16. This plasma etching process comprises the steps of:

applying a high frequency (1.6 MHz) biasing power (power applies to the substrate holder) of (750 W to the pedestal 72 holding wafer/workpiece 70 (col 8, lines 45-50, col 18, lines 10-12 and fig. 8) reads on applying a high frequency bias power at a first power level to the workpiece

raising the biasing power while flowing fluorocarbon and oxygen gas in the chamber resulting in higher ion energy /plasma (col 17, lines 55-58) reads on raising the processing gas to plasma



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switching the high frequency biasing power at 750 W to the high frequency biasing power at 200 W before clearing/removing the photoresist (col 17, lines 42-43, col 18, lines 10-15) reads on switching the high frequency biasing power level at first power level to the second high frequency biasing power level lower than the power level (200 W < 750W) before the photoresist film is completely removed.

Regarding claims 5-6, Li discloses using photoresist film 166 as a mask to form an opening pattern/specific pattern at silicon dioxide/ organic material film 42 formed on the substrate/ workpiece10 (col 7, lines 20-23 and fig. 18)

Claim Rejections - 35 USC § 103

- 3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 4. Claims 2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (US 6,284, 149) in view of Koshimizu (US 5,997, 687)

Li discloses a plasma etching process for removing a photoresist film 166, the photoresist film 166 with an opening pattern 168 having an opening area 168 larger than opening area of a hole 22 formed at insulating layer 16 of a substrate/workpiece 10, the opening 168 is used as a mask to plasma etch through the insulating layer 16. This plasma etching process comprises the steps of:



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Page 4

applying a high frequency (1.6 MHz) biasing power (power applies to the substrate holder) of (750 W to the pedestal 72 holding wafer/workpiece 70 (col 8, lines 45-50, col 18, lines 10-12 and fig. 8) reads on applying a high frequency bias power at a first power level to the workpiece

raising the biasing power while flowing fluorocarbon and oxygen gas in the chamber resulting in higher ion energy /plasma (col 17, lines 55-58) reads on raising the processing gas to plasma

switching the high frequency biasing power at 750 W to the high frequency biasing power at 200 W before clearing/removing the photoresist (col 17, lines 42-43, col 18, lines 10-15) reads on switching the high frequency biasing power level at first power level to the second high frequency biasing power level lower than the power level (200 W < 750W) before the photoresist film is completely removed.

Li differs from the instant claimed inventions as per claims 2, 4 by switching from high to lower biasing power level before the photoresist is completely removed instead of stopping the biasing power level.

However, Koshimizu discloses a plasma process for etching or ashing (removing photoresist) comprises the step of applying/controlling high frequency biasing power at 800 W and 0 W (stopping the biasing power) to the workpiece (col 9, lines 26-31) reads on stopping the application of high frequency biasing power to the workpiece.

Hence, one skilled in the art would have found it obvious to modify Li's method of plasma etching by stopping the biasing power level as per Koshimizu especially since Li teaches that biasing pow r n ds to be adjusted (col 14, lines 4-6) and Koshimizu

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discloses that as a result of applying and stopping biasing power level, the pulse plasma can be drawn into the substrate within a predetermined energy range to perform plasma processing. (col 9, lines 30-38)

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tatsumi et al (US 5,354,421), in a dry etching method, discloses that underlying layer selectivity could be improved by lowering the RF bias power.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAN VINH whose telephone number is 703 305-6302. The examiner can normally be reached on Monday-Friday 8:30 -6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BENJAMIN L UTECH can be reached on 703 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

LV January 7, 2002 DESCRIPTION OF THE STATE OF THE

				Application/Control No. 09/671,201		Reexaminat	Applicant(s)/Patent Under Reexamination SANO, MICHIAKI		
	Notice of References Cited						Art Unit	Dono 4 of 4	
			-		LAN VINH		1765	Page 1 of 1	
				U.S. P	ATENT DOCUM	MENTS			
~		Document Number Country Code-Number-Kind Code	Date MM-YYYY		· · · · · · · · · · · · · · · · · · ·	Name		Classification	
1	A	US-6284149	09-2001	Lietal				216/64	
1	В	US-5997,687	12-1999	Koshimizu				156/345	
	С	US-5354421	10-1994	Tatsur	ni et al			156/345	
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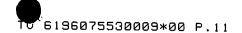
"A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 3

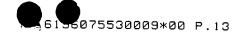
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OMB No. 0651-0011

INFORMATION DISCLOSURE CITATION (Us v rai sheets if nec asary)

						4-4
Atty. Docket No.	07553.0009		Serial No.	Not Ye	t Assigned	.s.
Applicant	Michiaki SANO		·			9/6
Filing Date	September 28, 2000		Group			60°F
	Ų	J.S. PATENT	DOCUMENTS			<u> </u>
Examiner Initial*	Document Number	Date	Name	Class	Sub Class	Filing Date If Appropriate
	FOF	REIGN PATEN	T DOCUMENTS			
	Document Number	Date	Country	Class	Sub Class	Translation Yes or No
LV	10-27789	1/27/98	Japan			Abstract
	OTHER DOCUMENTS (In	cluding Author	or, Title, Date, Perti	nent Pages	, Etc.)	
Examiner LAIO UTIVIA			Date Considered 1/7/2002			
*Examiner: Init	tial if reterence considered, w ough citation if not in conform mmunication to applicant.	hether or not o	itation is in conformationsidered. Include	ance with Mi copy of this	PEP 609: d	raw line next
Form PTO 1449		Pat	ent and Trademark	Office - U.S	. Departme	nt of Commerce



Attachment for PTO-948 (Rev. 03/01, or earlier) 6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein Identifying indicia, if provided, should include the title of the invention inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1 136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, MUST be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings MUST be approved by the examiner before the application will be allowed. No changes will be permitted to be made other than correction of informalities, unless the examiner has approved the proposed changes

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication

See 37 CFR 1.85(a)

Failure to take corrective action within the set period will result in ABANDONMENT of the application.

*